

US EPA ARCHIVE DOCUMENT

GZA
GeoEnvironmental, Inc.

Engineers and
Scientists

**CBI CLAIM
(REDACTED)**

December 21, 1999
File No. P3227.99

**COMPANY CONFIDENTIAL DOCUMENT (UNLIMITED TIME)
CONFIDENTIALITY CLAIM DOES NOT COVER INDIVIDUAL ANALYSIS
SHEETS, BORING LOGS, AND OTHER UNDERLYING DATA.**



Ms. Sharon Fennelly Enforcement Coordinator
U.S. Environmental Protection Agency
Office of Site Remediation & Restoration
One Congress Street
Suite 1100, Mail Code HBR
Boston, Massachusetts 02114-2023

140 Broadway
Providence
Rhode Island 02903
401-421-4140
FAX 401-751-8613
<http://www.gza.net>

Re: Centredale Manor
North Providence, Rhode Island

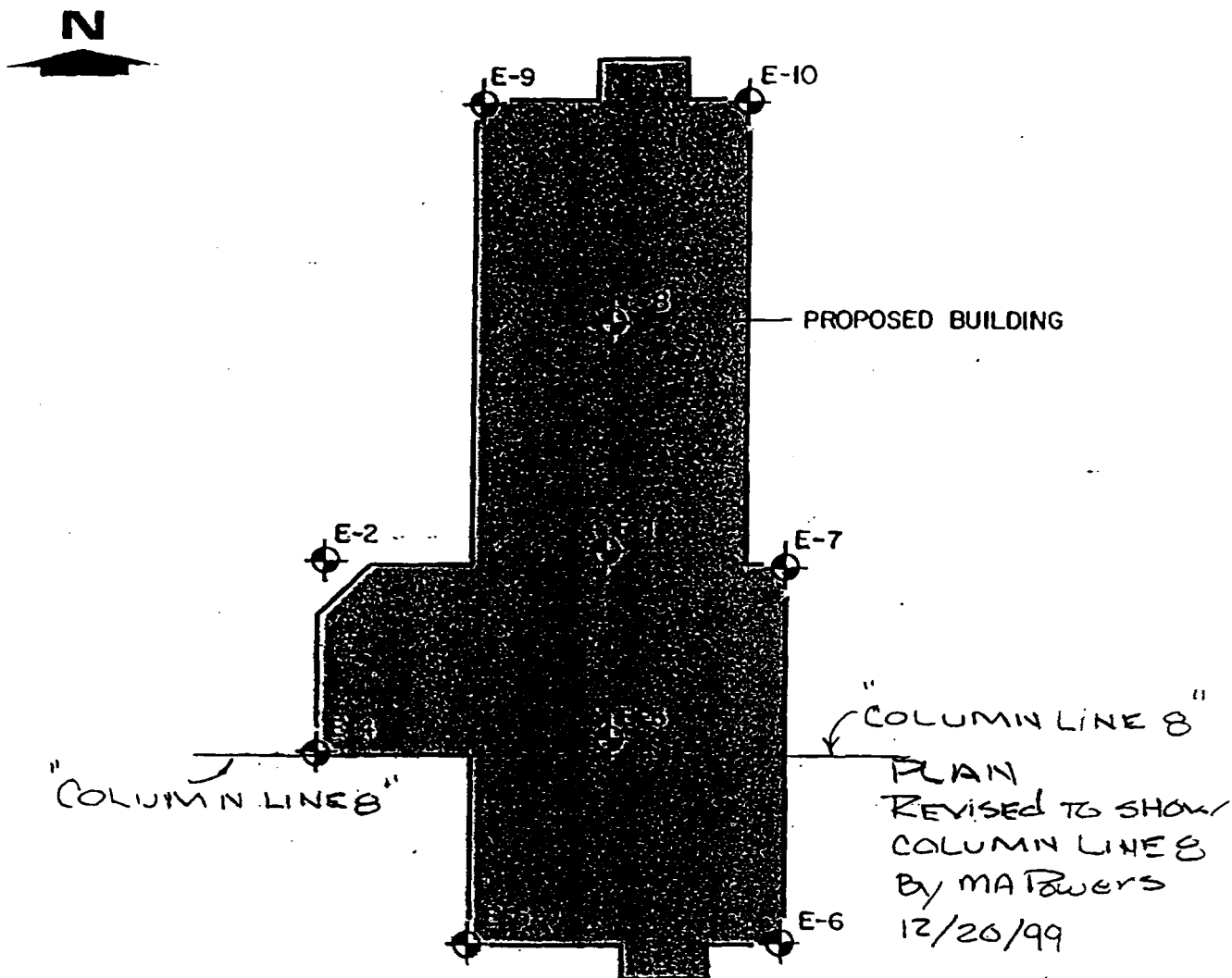
Dear Ms. Fennelly:

Pursuant to a letter dated December 7, 1999 (and received by GZA on December 8th) and our telephone conversations on December 10 and December 20, 1999, following is GZA's Response to EPA's Request for Supplemental Information and documentation relating to environmental conditions at property identified as Centredale Manor, in North Providence, Rhode Island.

A Subsidiary of GZA
GeoEnvironmental
Technologies, Inc.

US EPA ARCHIVE DOCUMENT

5614



NOTES

- 1) BORING LOCATIONS ARE APPROXIMATE
- 2) $\odot$ INDICATES APPROXIMATE LOCATION OF BORINGS BY GUILD DRILLING ON FEB. 2, 1982.
- 3) BORINGS WERE LOCATED BY MARSHALL CONTRACTORS INC.

FILE NO. P-3227



CENTERDALE MANOR
NORTH PROVIDENCE, RI

EXPLORATION LOCATION
PLAN

FEB 1982

FIGURE No. 1

CTBI
CLAIM
(REDACTED)

RESPONSIVE DOCUMENTS A - G
(REDACTED)
OF
INFORMATION REQUEST ANSWERS
PURSUANT TO SECTION 104 CERCLA
FOR
CENTREDALE MANOR SITE
BY
GZA, GEOENVIRONMENTAL, INC. (GZA)
ON
APRIL 14, 1999

CENTERDALE MANORCHEMICAL ANALYSES RESULTS

I. WATER SAMPLES

<u>SAMPLE NUMBER</u>	<u>SPECIFIC CONDUCTIVITY μMHOS/CM</u>	<u>pH¹</u>	<u>VOLATILE ORGANICS^{2,3} (compound - peak HT.)</u>
TP-A	245	6.06	N.D.
TP-B	240	5.84	N.D.
TP-C	430	6.58	1 unknown - very low

II. SOIL SAMPLES

<u>TEST PIT NO.</u>	<u>SAMPLE NO.</u>	<u>DEPTH</u>	<u>VOLATILE ORGANICS^{2,3} (compound - peak HT.)</u>
TP-A	S-1	2'-3'	3 unknown - very low
TP-A	S-2	5'	1 unknown - very low
TP-B	S-4	2.5'	N.D.
TP-C	S-6	2'	3 unknown - very low
TP-C	S-7	5'	1 unknown - very low

NOTES:

1. pH measured with a Model PHM-8100 Digital pH meter manufactured by Graphic Controls.
2. Volatile organic analyses with a Century Systems Model OVA-129 organic vapor analyzer/gas chromatograph employing headspace techniques. Sample injection size - 0.20 cc. Column employed was 12" long (T-12), packed with 10 percent 1, 2, 3, TRIS Propane on 60/80 mesh chromosorb P, AW.
3. N.D. indicates volatile organic not detected. "Unknowns" refer to unidentified peaks on chromatogram. Peak height is a subjective measure of relative concentration only. Very low generally indicates concentrations less than 0.1 parts per million (ppm).

US EPA ARCHIVE DOCUMENT

TEST PIT FIELD LOG

GOLDBERG · ZOINO & ASSOC., INC
GEOTECHNICAL/GEOHYDROLOGICAL
CONSULTANTS

PROJECT
DESCRIPTION CENTERDALE MANOR
LOCATION NORTH PROVIDENCE, R.I.

TEST PIT No. TP-A
FILE No. P-3227
DATE 1/12/82

GZA ENGINEER W. Kosinski

CONTRACTOR Pezza

GROUND ELEV. 97±

WEATHER Clear, Cold 10°-20°

EXCAVATION EQUIPMENT
OPERATOR _____
MAKE John Deere MODEL JD 510
CAPACITY 1+ cu yd REACH ft

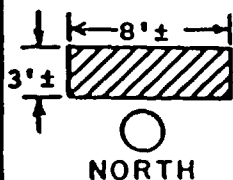
TIME STARTED AM

TIME COMPLETED AM

DEPTH	SOIL DESCRIPTION		EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMA No
0	Burmister				
1'	Rubbish GRANULAR FILL	Brown, dark brown, coarse to fine SAND, some coarse to fine Gravel, little Silt (non-plastic), little Rubbish Wood, Metal, etc. - RUBBISH FILL	E		
2'			E		
3'	Sandy Organic SILT	Dark brown, dark gray, Organic SILT and fine SAND, little- fine Gravel, trace+ Roots, Organic Silt, slightly plastic, water seeping in localized areas near 2' depth	E		1.
4'			E		
5'	5'± Sandy GRAVEL	Dark brown, coarse+ to fine GRAVEL, some+ coarse to fine Sand, trace Cobbles, trace+ non-plastic Silt	E		
6'			E - M		2.
7'	7.0'±	Approximate Bottom of test pit, could not be seen due to rapid groundwater seepage and caving in of sidewalls.	E - M		3.
8'					
9'		Note: Oil/chemical odor in all stratas			
10'		Groundwater level from seepage into pit, actual G.W.L. may be higher			
11'		Cobbles <u>> 4"</u> , <u>< 6"</u>			
12'					
13'					
14'					

REMARKS: 1. Jar sample obtained - S1 - at 2' to 3'±.
2. Jar sample obtained - S2 - at 5'±.
3. Water sample obtained from groundwater seepage into pit - GW-A.

TEST PIT PLAN



LEGEND:

BOULDER COUNT	
SIZE RANGE	LETTER DESIGNATION
6" - 18"	A
18" - 36"	B

PROPORTIONS

USED

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
MANY (MA.)	35 - 50%

ABBREVIATIONS

F - FINE
M - MEDIUM
C - COARSE
F/M - FINE TO MEDIUM
F/C - FINE TO COARSE
V - VERY
GR - GRAY
BN - BROWN

EXCAVATION

EFFORT

E - EASY
M - MODERATE
D - DIFFICULT
GROUNDWATER
ELAPSED TIME TO
DEFINING

US EPA ARCHIVE DOCUMENT

TEST PIT FIELD LOG

GOLDBERG · ZOINO & ASSOC., INC
GEOTECHNICAL/GEOHYDROLOGICAL
CONSULTANTS

PROJECT
DESCRIPTION CENTERDALE MANOR
LOCATION NORTH PROVIDENCE, R.I.

TEST PIT No. TP-B
FILE No. P-3227
DATE 1/12/82

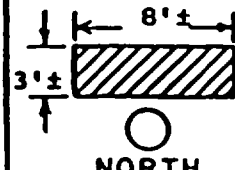
GZA ENGINEER W. Kosinski
WEATHER Clear, Cold 10°-20°

EXCAVATION EQUIPMENT
CONTRACTOR Pezza
OPERATOR _____
MAKE John Deere MODEL JD 510
CAPACITY 11 CYCL. REACH 11

GROUND ELEV. 95±
TIME STARTED AM
TIME COMPLETED AM

DEPTH	SOIL DESCRIPTION		EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMA No
0		Burmister			
0	2"-3"	Brown, green, fine Sandy LOAM, grassy, Roots			
1'	Sandy Or. SILT 1.5'	Dark gray, dark brown, Organic SILT and fine SAND, trace fine Gravel. trace Roots, Organic Silt, slightly plastic, water seeping in localized areas	E		
2'	2.5'	Gray, medium to fine SAND, trace+ coarse Sand and fine Gravel, trace Silt	E		1.
3'	3.0'±	Brown, gray, coarse+ to fine GRAVEL, some+ coarse to fine Sand, trace+ Cobbles, trace non-plastic Silt	E		2.
4'	Sandy GRAVEL		E		
5'			E - M		3.
6'	6'±	Approximate, Bottom of test pit could not be seen due to rapid groundwater seepage and caving in of sidewalls.	E - M		
7'		Note: No oil or chemical type odor			
8'		Groundwater level from seepage into pit, actual G.W.L. may be higher			
9'		Cobbles <u>> 4"</u> , <u>≤ 6"</u>			
10'					
11'					
12'					
13'					
14'					

REMARKS: 1. Jar sample obtained - S3 - at 1.0' - 1.5'±.
2. Jar sample obtained - S4 - at 2.5'±.
3. Water sample obtained from groundwater seepage into pit - GW-B.

TEST PIT PLAN	LEGEND:	PROPORTIONS USED	ABBREVIATIONS	EXCAVATION EFFORT
	BOULDER COUNT SIZE RANGE LETTER CLASSIFICATION DESIGNATION 6" - 18" A 18" - 36" B	TRACE (TR.) 0 - 10% LITTLE (LI.) 10 - 20% SOME (SO.) 20 - 35% 35 - 50%	F - FINE M - MEDIUM C - COARSE F/M - FINE TO MEDIUM F/C - FINE TO COARSE V - VERY GR - GRAY BR - BROWN	E - EASY M - MODERATE D - DIFFICULT GROUNDWATER ELAPSED TIME TO G1

TEST PIT FIELD LOG

GOLDBERG · ZOINO & ASSOC., INC
GEOTECHNICAL/GEOHYDROLOGICAL
CONSULTANTS

PROJECT
DESCRIPTION CENTERDALE MANOR
LOCATION NORTH PROVIDENCE, R.I.

TEST PIT No. TP-C
FILE No. P-3227
DATE 1/12/82

GZA ENGINEER W. Kosinski
WEATHER Clear, Cold 10°-20°

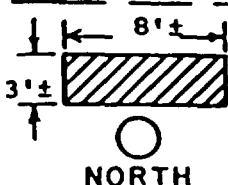
EXCAVATION EQUIPMENT
CONTRACTOR Pezza
OPERATOR
MAKE John Deere MODEL JD 510
CAPACITY 1 1/2 cu yd. REACH 11 ft.

GROUND ELEV. 97±
TIME STARTED AM
TIME COMPLETED AM

DEPTH	SOIL DESCRIPTION		EXCAV. EFFORT	BOULDER COUNT QTY. CLASS.	REMARKS No.
0		Burmister			
0.5-1.0		Brown, dark brown, coarse to fine SAND, some coarse to fine Gravel	E		
1'		Brown-gray, Organic SILT and fine SAND, little- fine Gravel, trace Roots, Organic Silt, slightly plastic	E		1.
2'	Sandy Organic SILT	Localized areas of water seepage. Sweet chemical odor.	E		
3'	3.25				
4'	Sandy GRAVEL	Brown, dark gray, stained, coarse+ to fine GRAVEL, some+ coarse to fine Sand, trace+ Cobbles, trace non-plastic Silt	E		
5'			E - M		
6'	5.5'		E - M		2.
7'	7.0'±	Approximate, Bottom of test pit could not see due to rapid groundwater seepage and caving in of side walls.	E - M		3.
8'					
9'					
10'		Note: Sweet chemical odor in Sandy Organic SILT stratum, oily odor in Sandy GRAVEL stratum.			
11'					
12'		Groundwater level from seepage in pit, actual G.W.L. maybe higher			
13'		Cobbles ≥ 4", ≤ 6"			
14'					

REMARKS: 1. Jar sample obtained - - @2'±.
2. Jar sample obtained - - @5'±.
3. Water sample obtained from groundwater seepage into pit - GW-C.

TEST PIT PLAN



LEGEND:

BOULDER COUNT	LETTER DESIGNATION
SIZE RANGE CLASSIFICATION	
6" - 18"	A
18" - 36"	B
36" AND LARGER	C

PROPORTIONS USED

TRACE (TR.)	0 - 10%
LITTLE (LI.)	10 - 20%
SOME (SO.)	20 - 35%
AND	35 - 50%

ABBREVIATIONS

F - FINE
M - MEDIUM
C - COARSE
F/M - FINE TO MEDIUM
F/C - FINE TO COARSE
V - VERY
GR - GRAY
BN - BROWN
YEL - YELLOW

EXCAVATION EFFORT

E - EASY
M - MODERATE
D - DIFFICULT
GROUNDWATER
ELAPSED TIME TO READING
2" G.W.

APPENDIX A
TEST BORING LOGS

HAMMER

Allstate Drilling Co.

PROVIDENCE, R. I. 02915

SHEET 1 OF 1

LOCATION No. Prov.

HOLE NO. B-1

LINE & STA.

OFFSET

CASING WT. 300 FALL 24

SAMPLER WT. 140 FALL 30

CLIENT: Marshall Contractors

PROJECT: Centredale Manor

INSPECTOR

DRILLER R. Cook, Jr.

HELPER J. Jagielo

SAMPLER I D. 1 3/8

CASING I D. 2 1/2

ALLSTATE NO. V-725

DATE, START 10/17/81

DATE, FINISH 10/17/81

GROUND ELEVATION 97.1

GROUND WATER DEPTH 4.1

DEPTH BELOW SURFACE	CASING BLOWS PER FOOT	SAMPLE NO. DEPTHS ELEV. FT.	TYPE OF SAMPLE	PENETRATION BLOWS PER 6 INCHES	DENSITY OR CONSIST REMARKS	PROBE CHANGE DEPTH FEET	FIELD IDENTIFICATION OF SOILS, REMARKS REMARKS INCLUDE COLOR, GRADATION, TYPE OF SOIL, ETC. BORE CONDITION, TYPE, CONDITION, HARDNESS, DRILLING TIME, BEAMS, ETC.
0	1	0-1.5	D	1-5-3	loose	6.1'	F-M DK BR SAND AND GRAVEL, little silt and rubbish - fill
	5						
	2						
	1						
	1	6-6-5	D	1-1-7	med dense	20.5'	F-C LT GRAY SAND, trace of silt
	10						
	37						
	22						
	17						
-10	4	10-11.5	D	5-5-6			
	5						
	12						
	12						
	12						
	6	15-16.5	D	8-9-9	loose	23.8'	F-C LT GRAY-BROWN SAND, trace of gravel, trace of silt
	6						
	11						
	12						
	12						
-20	5	20-21.5	D	5-3-2			
	5						
	8						
	9						
	11						
	11	25-26.5	D	2-3-4	med dense		F-C LT BR SAND, trace of silt (running)
	9						
	11						
	15						
	18						
-30	24	30-31.5	D	10-14-12			
	26						
	30						
	30						
	31						
		35-36.5	D	14-8-13			
-40							

GROUND SURFACE TO

FT. USED

CASING: THEN

HOLE NO.

B-1

Type of Sample

D - Dry C - Consolidated W - Washed
 HP - Hardened Piston
 P - Test Pit A - Auger
 1P - Hardened Piston
 1P - Test Pit

Proportions Used

0 to 10%
 11 to 20%
 21 to 30%
 31 to 40%
 41 to 50%

Penetration Resistance

140 lb. Wt. falling 30" on 2"
 Consistency

Very Loose
 Loose
 Med. Dense
 Dense
 Very Dense

Cohesion or Consistency

0.2
 3.4
 5.8
 9.15
 16.30
 31.4

Very Soft
 Soft
 Med. Stiff
 Stiff
 Very Stiff
 Hard

Earth Boring

36.5'

Bore Casing

-

Samples

D-8

HAMMER

Allstate Drilling Co.

PROVIDENCE, R. I. 02915

SHEET 1 OF 1
LOCATION No. Prov.,
HOLE NO. B-3
LINE & STA. _____
OFFSET _____

CASING WT. 300 FALL 24

SAMPLER WT 140 FALL 30

CLIENT: Marshall Contractors
PROJECT: Centredale Manor

INSPECTOR: _____
DRIVER: R. Cook, Jr.
HELPER: J. Jagielo

SAMPLER I.D. 1 3/8
CASING I.D. 2 1/2

ALLSTATE NO. V-725
DATE, START 10/16/81
DATE, FINISH 10/16/81

GROUND ELEVATION 47.7
GROUND WATER DEPTH 4.5'

[illegible]

GROUND SURFACE TO

FT. USED

CASING: THEN

HOLE NO. B-3

Type of sample

D - Dig C - Crest W - Windward
UP - Underwater Piston
IP - Test Pit A - Auger
IS - Undisturbed Shells
V - Vane Test

Propositions Used

Time	to	10%
1st	11	70%
2nd	21	35%
3rd	36	40%

140 lb
Cutaneous Density

0-4	Very loose
5-9	Loose
10-29	Med Dense
30-49	Dense
50-64	Very Dense

Penetration Resistance
At Wt tolling 30" on 2" O.D. sampler
Cohesive Consistency

02	Very Soft
34	Soft
58	Med. Stiff
915	Stiff
1430	v Stiff
111	Hard

Earth Boring _____
Rock Core _____
Samples _____

[illegible]

GROUND SURFACE TO			FT. USED		CASING, THEN		Penetration Resistance 140 lb Wt falling 39" on 2" (1) D Sampler						MOLE NO.	
							Cohesionless Density			Cohesive Consistency			<u>B-4</u> <u>Summary</u>	
True rd sample			Proportions Used											
D: Dry	C: Coated	W: Washed	size	to 10%	0.4	Very loose	0.7	Very Soft				Earth Boring		26.3'
UP: Undisturbed Piston			fine	11 to 20% <td>5.9</td> <td>Loose</td> <td>3.4</td> <td>Soft</td> <td colspan="3"></td> <td colspan="2">Rock Coring</td> <td>-</td>	5.9	Loose	3.4	Soft				Rock Coring		-
TP = Test Pit	A = Auger		some	21 to 35% <td>10.29</td> <td>Med Dense</td> <td>5.8</td> <td>M/Sd/H</td> <td colspan="3"></td> <td colspan="2">Samples</td> <td>D=6</td>	10.29	Med Dense	5.8	M/Sd/H				Samples		D=6
US - Unstabilized Soils			and	36 to 50% <td>30.49</td> <td>Dense</td> <td>9.15</td> <td>Sd/H</td> <td colspan="3"></td> <td colspan="2"></td> <td></td>	30.49	Dense	9.15	Sd/H						
V - Vane Test					50	Very Dense	14.30	V Sd/H						
							11.4	Hard						

HAMMER

Allstate Drilling Co.

PROVIDENCE, R. I. 02915

CASING WT 300 FALL 24

SAMPLER WT 140 FALL 30

CLIENT: Marshall Contractors
PROJECT: Centredale Manor

SHEET 1 OF 1
LOCATION No. Prov. 1
HOLE NO B-5
LINE & STA. _____
OFFSET _____

INSPECTOR

ORIGIN R. Cook, Jr.

NAME J. Jagielo

SAMPLER 1 D 1 3/8

CASING I D. 21

ALLSTATE NO. V-725

DATE, START 10/17/81

DATE, FINISH 10/17/81

GROUND ELEVATION 76

GROUND WATER DEPTH 1.7

[illegible]

GROUND SURFACE TO

FT. USED

CASING: THEN

HOLE NO. **B-5**

Type of Sample

U - Dry C - Corred W - Washed
UP - Underside of Piston
IP - Test Pin & - Gauge
US - Underside of shaft
V - Valve Test

Preparations Used

None	8 to 10%
little	11 to 20%
some	21 to 35%
and	36 to 40%

Penetration Resistance
140 lb. Wt. falling 30" on 2" O.D. Sampler
Cohesive Density Cohesive Consistency

Very loose	0.2	Very Soft
Loose	3.4	Soft
Med. Dense	5.8	Med. Stiff
Dense	9.15	Stiff
Very Dense	16.30	Very Stiff
	31.4	Hard

Summary
Furth Spring 26.5'
Rock Coring -
Saturated D-6

HAMMER CASING WT 300 FALL 24 SAMPLER WT 140 FALL 30	Allstate Drilling Co. PROVIDENCE, R. I. 02915 CLIENT: <u>Marshall Contractors</u> PROJECT: <u>Centredale Manor</u>	SHEET <u>1</u> OF <u>2</u> LOCATION <u>No. Prov, RI</u> HOLE NO <u>B-6</u> LINE & STA. _____ OFFSET _____
INSPECTOR: _____ DRILLER: <u>R. Cook</u> HELPER: <u>J. Jagielo</u>	SAMPLER I.D. <u>1 3/8"</u> CASING I.D. <u>2 1/2"</u>	ALLSTATE NO. <u>V-725</u> DATE START <u>11/5/81</u> DATE FINISH <u>11/5/81</u> GROUND ELEVATION _____ GROUND WATER DEPTH <u>2.9'</u>

DEPTH BELOW SURFACE	CASING BLOWS PER FOOT	SAMPLE NO DEPTHS	TYPE OF SAMPLE	PENETRATION BLOWS PER 6 INCHES	DENSITY OR CONSIST	PROFILE CHANGE DEPTH	FIELD IDENTIFICATION OF SOILS. REMARKS
							REMARKS: INCLUDE COLOR, GRADATION, TYPE OF SOIL, ETC. NOTE: CO. & TYPE, CONDITION, HARDNESS, DRAINING TIME, SEAMS, ETC.
0	1	0-1.5	D	3-6-2	loose		F-M DK BR SAND AND GRAV., lt. silt and rubbish - fill
	5						
	6						
	3						
	2						
	11	5-6-5	D	39-31-53	very dense	6.2'	
	20						
	33						F-C LT GRAY SAND AND GRAV., tr of silt
	30						
-10	33						
	11	10-11	5 D	15-13-15	med dense		
	12					12.3'	
	9						
	4				med dense	14.7'	F LT BR SAND, tr of silt
	5				loose		
	6	15-16	5 D	4-3-3			F LT GRAY SAND, tr of silt
	6						
	6					19.0'	
	9						
-20	8				very loose		F LT BR SAND, tr of silt
	7	20-21	5 D	1-2-2			
	7					23.0'	
	5						
	18						F-C LT BR SAND, tr of silt
	18						
	7	25-26	5 D	8-14-18	dense		
	14					28.1'	
	16						
	15						F-C LT BR SAND AND GRAV., tr of silt
-30	18						
	15	30-31	5 D	10-22-20	dense		
	20						
	22						
	26						
	20						
	14	35-36	5 D	12-14-14	med dense		
	18						
	15						
	14						
-40	14	40-41	5 D	15-13-6			

GROUND SURFACE TO

FT. USED

CASING: THEN

HOLE NO.

B-6

Type of Sample
 (D) = Dry C = Cores W = Washed
 (U) = Undisturbed Portion
 (P) = Test Portion A = Auger
 (S) = (S) = Standard Sample
 (V) = Visual Test

Proportions Used
 trace 0 to 10%
 little 11 to 20%
 some 21 to 35%
 and 36 to 50%

Penetration Resistance
 140 lb. Wt. falling 30" on 2" O.D. Sampler
 Cohesionless Density
 Cohesive Consistency

0-4	Very Loose	0-7	Very Soft
5-9	Loose	3-4	Soft
10-29	Med. Dense	5-8	Med. Stiff
30-49	Dense	9-15	Stiff
50-100	Very Dense	16-30	V. Stiff
		31-100	Hard

Earth Boring Summary
61.5'
 Rock Coring
 Samples D-13

HAMMER

Allstate Drilling Co.

PROVIDENCE, R. I. 02915

SHEET 1 OF 1

LOCATION No. Prov. RI

HOLE NO. **B-7**

LINE & STA

OFFSET

CASING. WT. 300 FALL 24

SAMPLER WT 140 FALL 30

CLIENT: Marshall Contractors

PROJECT: **Centredale Manor**

INSPECTOR

ORDERED R. Cook, Jr.

NAME: J. Jagielo

SAMPLER I D 13/8

CASING 1 U. 21

ALLSTATE NO. Y-725

DATE START 11/10/81

DATE, FINISH: 11/10/81

GROUND ELEVATION

GROUND WATER DEPTH 3.3'

[illegible]

Note: Water kept pumping while pulling rods in & out of casing

GROUND SURFACE TO

IT USES

CASING: THEN

HOLE NO

B-7

ה'תשנ"א

Fragestunde

Penetration of Penicillin

140 H. v. 1 coll. on 2" O.D. Sample.

on 2" OD Sample.

10.
11.
12.
13.
14.

1940	11	1941	11
1942	11	1943	11
1944	11	1945	11
1946	11	1947	11
1948	11	1949	11
1950	11	1951	11
1952	11	1953	11
1954	11	1955	11
1956	11	1957	11
1958	11	1959	11
1960	11	1961	11
1962	11	1963	11
1964	11	1965	11
1966	11	1967	11
1968	11	1969	11
1970	11	1971	11
1972	11	1973	11
1974	11	1975	11
1976	11	1977	11
1978	11	1979	11
1980	11	1981	11
1982	11	1983	11
1984	11	1985	11
1986	11	1987	11
1988	11	1989	11
1990	11	1991	11
1992	11	1993	11
1994	11	1995	11
1996	11	1997	11
1998	11	1999	11
2000	11	2001	11
2002	11	2003	11
2004	11	2005	11
2006	11	2007	11
2008	11	2009	11
2010	11	2011	11
2012	11	2013	11
2014	11	2015	11
2016	11	2017	11
2018	11	2019	11
2020	11	2021	11
2022	11	2023	11
2024	11	2025	11
2026	11	2027	11
2028	11	2029	11
2030	11	2031	11
2032	11	2033	11
2034	11	2035	11
2036	11	2037	11
2038	11	2039	11
2040	11	2041	11
2042	11	2043	11
2044	11	2045	11
2046	11	2047	11
2048	11	2049	11
2050	11	2051	11
2052	11	2053	11
2054	11	2055	11
2056	11	2057	11
2058	11	2059	11
2060	11	2061	11
2062	11	2063	11
2064	11	2065	11
2066	11	2067	11
2068	11	2069	11
2070	11	2071	11
2072	11	2073	11
2074	11	2075	11
2076	11	2077	11
2078	11	2079	11
2080	11	2081	11
2082	11	2083	11
2084	11	2085	11
2086	11	2087	11
2088	11	2089	11
2090	11	2091	11
2092	11	2093	11
2094	11	2095	11
2096	11	2097	11
2098	11	2099	11
2100	11	2101	11
2102	11	2103	11
2104	11	2105	11
2106	11	2107	11
2108	11	2109	11
2110	11	2111	11
2112	11	2113	11
2114	11	2115	11
2116	11	2117	11
2118	11	2119	11
2120	11	2121	11
2122	11	2123	11
2124	11	2125	11
2126	11	2127	11
2128	11	2129	11

Very	Low	0.7	Very Safe
	Low	1.4	Safe
Med	Low	3.8	Moderate
	Low	9.15	Unsafe
	High	19.32	Very Unsafe

21.5'

Figure 3. *Effect of the concentration of the initiator on the polymerization of 1,4-bis(4-vinylphenyl)benzene in the presence of 1,4-bis(4-vinylphenyl)benzene.*

D-3

HAMMER

Allstate Drilling Co.

PROVIDENCE, R. I. 02915

SHEET 1 of 1LOCATION No. Prov.HOLE NO. B-8

LINE & STA

OFFSET

CASING WT. 300 FALL 24SAMPLER WT. 140 FALL 30CLIENT: Marshall ContractorsPROJECT: Centredale Manor

INSPECTOR:

DEALER: R. Cook, Jr.HELPER: J. JagieloSAMPLER I.D. 1 3/8"CASING I.D. 2 1/2"ALLSTATE NO. V-725DATE, START 11/10/81DATE, FINISH 11/10/81

GROUND ELEVATION

GROUND WATER DEPTH 1.4'

DEPTH BLOW SURFACE	CASING BLOWS PER FOOT	SAMPLE NO. DEPTHS ELEV. FT.	TYPE OF SAMPLE	PENETRATION BLOWS PER 6 INCHES	DENSITY OR CONSIST. MOISTURE	PROFILE CHANGE DEPTH ELEV.	FIELD IDENTIFICATION OF SOILS, REMARKS REMARKS WILL INCLUDE: GRADATION, TYPE OF SOIL, ETC. MOISTURE, COLOR, TEMPERATURE, HARDNESS, DRAINAGE, TIME, SEAMS, ETC.
-0	1						No samples to 10.0'
	2						
	4						
	20						
	14						
	29						
	32						
	33						
	24						
	17					10.0'	
-10	7	10-11.5	D	10-4-4	loose		F-C LT GRAY SAND AND GRAV., tr of silt
	8						
	12						
	8					14.3'	
	12	15-16.5	D	1-2-2	very loose		F LT BR SAND, little silt
	10						
	11						
	11						
-20	15					20.0'	COBBLE
		20-21.5	D	31-23-12		21.0'	
					med dense	21.5'	
							NOTE: Water maintained in casing while pulling rods in & out of casing
-30							NOTE: Water maintained in casing while pulling rods in & out of casing
-40							NOTE: Water maintained in casing while pulling rods in & out of casing

GROUND SURFACE TO

FE USED

CASING THEN

HOLE NO. B-8

Type of Sample
 U. Try - Co. Chisel - W. Washed
 UP - Undisturbed
 TP - Test Pit
 TS - Test Sample

Expansive Effort

Moisture
 Little 6 to 10%
 11 to 20%
 21 to 35%
 36 to 50%

Penetration Resistance
 140 lb. Wt. falling 30" on 2" O.D. Sampler
 Consistency
 Very loose
 loose
 med
 dense
 very dense

Cohesive Consistency
 0.7 Very Soft
 3.4 Soft
 5.8 Med. Stiff
 9.15 Stiff
 16.0 Very Stiff
 22.0

Earth Boring
 Rock Core
 Samples

Summary

21.5'

D-3

GUILD DRILLING CO., INC.

100 WATER STREET EAST PROVIDENCE, R. I.

TO American Pile Driving Corporation ADDRESS East Providence, R.I.
 SUBJECT NAME Check Borings for Proposed LOCATION North Providence, R.I.
 REPORT SENT TO above / Centredale Manor PROJ. NO. _____
 SAMPLES SENT TO " OUR JOB NO. 82-186

SHEET 1 of 1
 DATE _____
 HOLE NO. 2
 LINE & STA. _____
 OFFSET _____
 SURF. ELEV. _____

GROUND WATER OBSERVATIONS		RODS-"AW"	CASING	SAMPLER	CORE BAR	Date	Time
At _____ after _____ Hours		Type	BW	S/S		START	12/23/81
At _____ after _____ Hours		Size ID	2 1/2"	1 3/8"		COMPLETE	12/23/81
		Hammer Wt	300#	140#	BIT	TOTAL HRS.	
		Hammer Fall	24"	30"		BORING FOREMAN	T. Paquette
						INSPECTOR	
						SOILS ENGR.	

LOCATION OF BORING:

DEPTH	Casing Blows per foot	Sample Depths From- To	Type of Sample	Blows per 6" on Sampler			Moisture Density or Consist	Strata Change Elev	SOIL IDENTIFICATION Remarks include color, gradation, Type of soil etc. Rock-color, type, condition, hard- ness, Drilling time, seams and etc	SAMPLE		
				From 0-6	6-12	12-18				No	Pen	Re
3		0'-1.5'	D	5	6	7	Moist medium dense		Brown fine to coarse Sand, Silt, Asphalt & Gravel FILL	1	1.50.	
4												
5												
7												
9												
30		5'-6.5'	D	9	84	24	Wet very dense	9.5'	Brown Black coarse to fine Sand, Silt & coarse to fine Gravel, Cobbles	2	1.50.	
35												
76												
84												
41												
8		10'-11.5'	D	14	6	6	Wet medium dense		Gray fine to coarse SAND, some medium to fine gravel, little silt	3	1.50.	
10												
9												
9												
8												
16		15'-16.5'	D	9	3	2	Wet loose	15.5'	Gray Brown very fine to fine silty SAND	4	1.50.	
9												
10												
9												
9												
10		20'-21.5'	D	1	2	1	"	21.5'		5	1.51.	
9		21.5'-22'	D	7			Wet/m stiff	22'	Yellow Brown SILT & fine Sand	5A	0.50.	
14												
17												
18												
17		25'-26.5'	D	4	6	5	Wet/m dense	27' ±	Reddish Brown medium to fine SAND, some silt, little fine to medium gravel (running)	6	1.50.	
14												
23												
29												
26												
14		30'-31.5'	D	14	10	10	"		Brown coarse to fine SAND, some medium to fine gravel, trace of silt	7	1.50.	
20												
21									(33'-34' Boulder - casing bent @ this point)			
53									(sand running)			
15												
20		35'-36.5'	D	9	11	17	"		Brown fine to coarse SAND & Gravel, little silt	8	1.50.	
49												
58												
39												
34												

GROUND SURFACE TO 60' USED BW CASING THEN S/S to 61.5'
 Sample Type | Proportions Used | 140# Wt & 30" fall on 2" OD Sampler | SURVEY
 North Providence, R.I.

US EPA ARCHIVE DOCUMENT

APPENDIX 3

ROBINSON GREEN BERETTA TEST PIT LOGS

THE ROBINSON GREEN BERETTA CORPORATION

2 JOHN STREET PROVIDENCE, RHODE ISLAND 02906 401 272-1730

TEST PITS - October 16, 1981

Project: Centerdale Manor

RGB #2629

Observed by the Following:

W. Lund
R. Keaney
G. H. Graf

Marshall Contractors, Inc.
Marshall Contractors, Inc.
The Robinson Green Beretta Corp.

TP-1 Moved 20' West

0 to 2" broken asphalt
2" to 4'-0" mixed sand and gravel fill
some oil and chemical saturation
chemical odors
4'-0" to 6'-0" silty subsoil with chemical saturation
6'-0" to 7'-0" boney gravel
water weeping @ 4'-0"

TP-2

0 to 2'-0" mixed debris
2'-0" to 3'-0" silty subsoil, possible fill
3'-0" to 10'-0" med. dense boney gravel
water @ 5'-0" +

TP-3

0 to 4'-0" silt & sand fill
4'-0" to 5'-0" probable original topsoil and peat
5'-0" to 10'-0" med. dense boney gravel
water @ 4'-6" +

TP-4

0 to 4'-6" misc. earth and organic fill
4'-6" to 6'-0" probable original subsoil
6'-0" to 9'-0" boney gravel
water running @ 3'-0" +
all stratas saturated with heavy oil

TP-5

0 to 4'-0" misc. organic fill
4'-0" to 5'-6" probable original top & subsoil
5'-6" to 10'-0" med. dense boney gravel
water running @ 3'-0"

.. TEST PITS - October 16, 1981
Project: Centerdale Manor
RGB #2629

TP-6 15' West of B-2

0 to 3'-6" earth & timber debris
3'-6" to 4'-6" silty subsoil, perched water @ 2'-6"
4'-6" to 9'-0" med. dense boney gravel

NOTE: All test pits had chemical odors

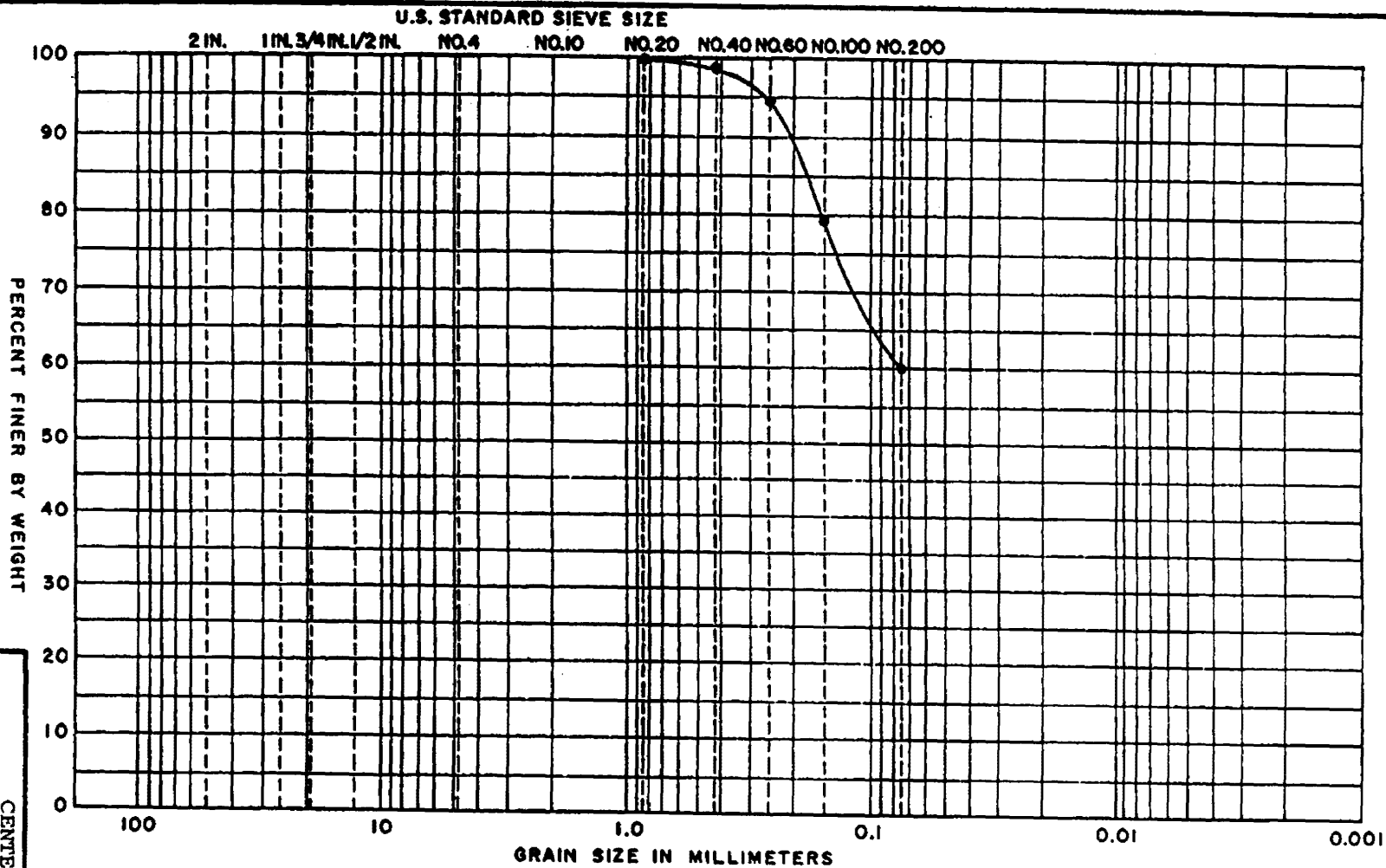
GHG:sek

APPENDIX C
LABORATORY TEST RESULTS

GRADATION TESTS

CENTERDALE MANOR

BORING NO. B4 TEST SERIES
 SAMPLE NO. 1
 DEPTH 10.0-11.5' DATE Jan 198:
 TECH. OCV/ECW/CH



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

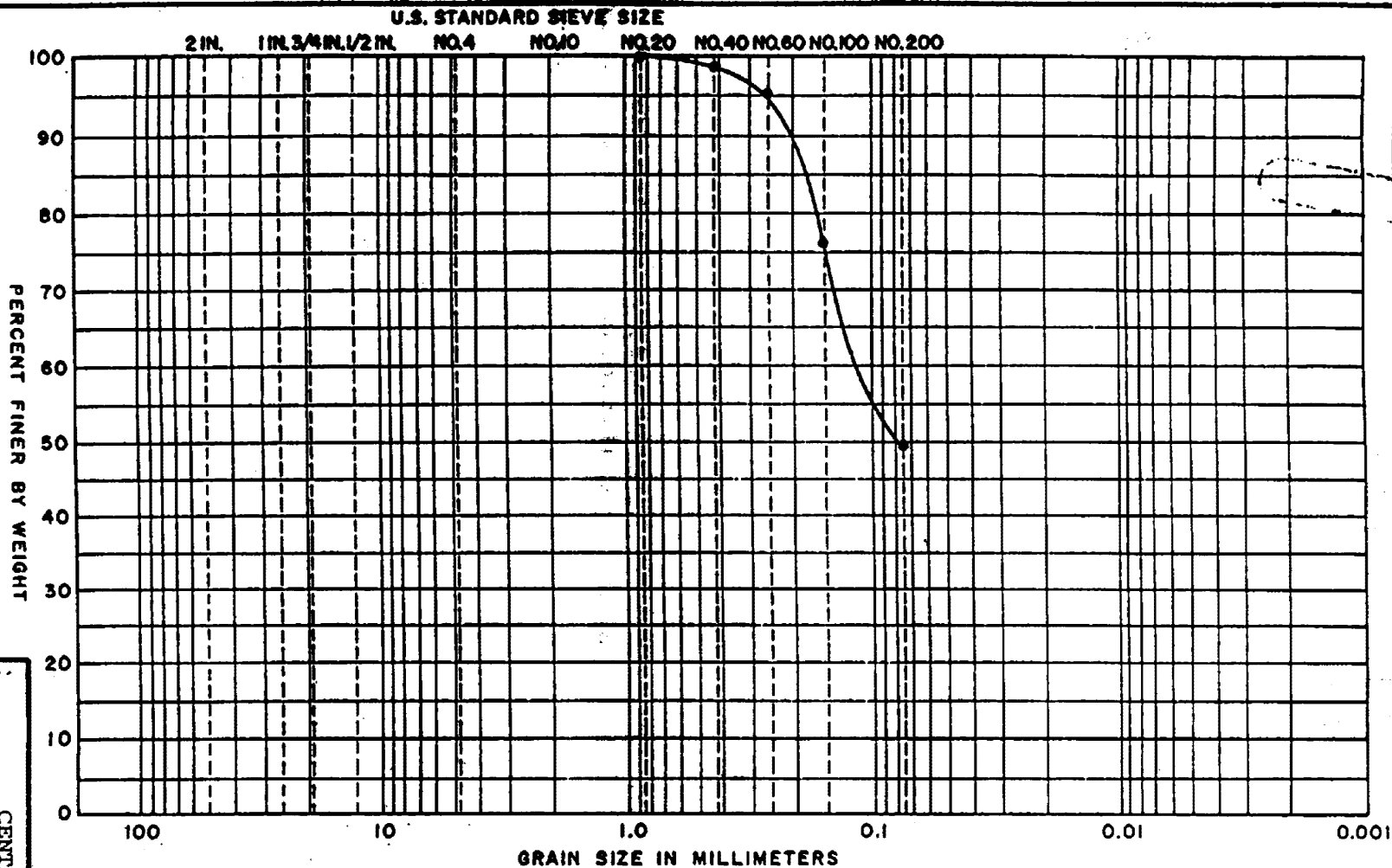
UNIFIED SOIL CLASSIFICATION SYSTEM

TEST NO.	SYM.	MATERIAL SOURCE	REMARKS
Sl.1		Boring B4 Depth 10.0 - 11.5'	Light brown SILT and fine SAND

BORING NO. Hole 2 TEST SERIES
 SAMPLE NO. 2
 DEPTH 20.0 - 21.5' DATE Jan 1982
 TECH. _____
 REVIEWED _____

GRADATION TESTS

CENTERDALE MANOR



COBBLES	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

UNIFIED SOIL CLASSIFICATION SYSTEM

TEST NO.	SYM.	MATERIAL SOURCE	REMARKS
S2.1		Boring Hole 2 Depth 20.0 - 21.5	Light brown fine SAND and SILT

FIELD SUMMARY

FILE No. P3227

DATE 1/27/82 REPORT No. -- SHEET 1 OF 1
PROJECT Centerdale Manor LOCATION North Providence
CLIENT The Robinson Green Beretta Corp. CONTRACTOR Guild Drilling Co., Inc.
WEATHER CONDITIONS Sunny/Cold REMARKS Groundwater Sampling

A. Arrived on site at 1:00 p.m. Left site at 4:00 p.m. and arrived at R. I. Analytical (Warwick) at 4:30 p.m. for sample delivery. Returned to GZA, Providence, at 5:15 p.m.

B. Equipment Working:

One Guild Drilling Co. truck-mounted acker drill was in position over the borehole location. Four inch (4") diameter casing was in place to depth. A three foot (3') length well screen and gas pump with a one inch (1") discharge line were employed to effect pumping.

C. Work Performed:

Pumping was initiated at 3:05 p.m. with the wellpoint in place at a depth of 9 feet relative to ground surface. Screen was in place at depth of approximately 6' to 9'.

At 3:35 p.m. two (2) one-liter samples were collected for subsequent chemical analysis by R. I. Analytical.

D. Remarks:

Present on site were Guild Driller, Paul Brescia and helper, and Tony DeFelice, a representative of Marshall Contractors, Inc. Mr. DeFelice requested that a copy of this field summary as well as results of the chemical analyses be sent to Bill Lund of Marshall Contractors, Inc.



ON-JOB TIME	<u>3.5</u>
TRAVEL TIME	<u>1.0</u>
OFFICE TIME	<u>0.5</u>
TOTAL TIME	<u>5.0</u>

Michael Sherill

PREPARED BY



R.I. Analytical Laboratories, Inc.

SPECIALIZING IN ENVIRONMENTAL ANALYSIS

231 ELM STREET
WARWICK, R. I. 02888

PHONE: (401) 467-2452

CERTIFICATE OF ANALYSIS

REPORT TO: Goldberg Zoino & Associates293 South Main StreetProvidence, RI 02903Attn: Mr. Michael PowersDATE RECEIVED 1/27/82DATE REPORTED 2/2/82

PURCHASE ORDER NO. _____

R.I.A.L. INV. NO. 5995SAMPLE DESCRIPTION One aqueous sample from Centerdale Manor (GZA 3227)

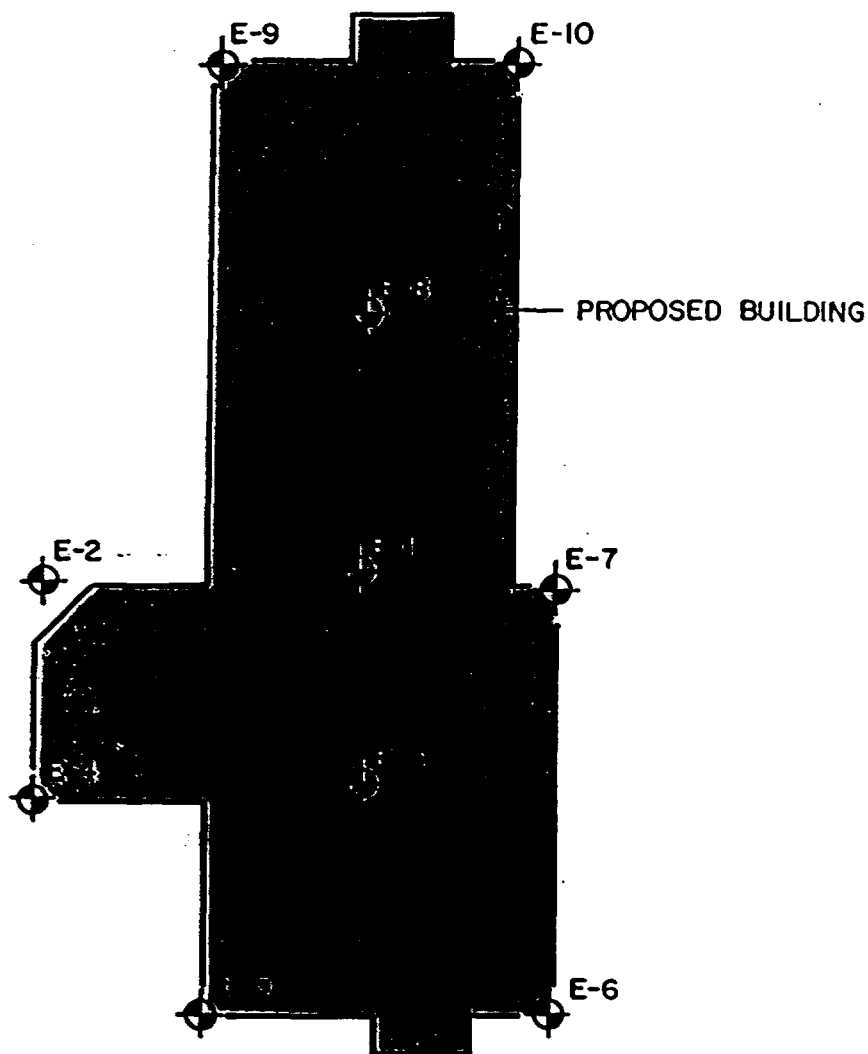
Per your request, subject sample has been analyzed by our laboratory with the following results:

<u>PARAMETER</u>	<u>RESULTS</u>
pH	6.2
Alkalinity (up to pH 4.3)	122 mg/l (as CaCO ₃)
Chloride	44.6 mg/l
Nitrate (as N)	0.30 mg/l
Sulfate (as SO ₄)	17.0 mg/l
Calcium	13 mg/l
Sodium	52 mg/l

If you have any questions regarding this work or if we may be of further assistance, please contact us.

APPROVED BY

Anthony E. Perrotti



NOTES

- 1) BORING LOCATIONS ARE APPROXIMATE
- 2) INDICATES APPROXIMATE LOCATION OF BORINGS BY GUILD DRILLING ON FEB. 2, 1982.
- 3) BORINGS WERE LOCATED BY MARSHALL CONTRACTORS INC.

SCALE: 1" $\approx$ 40'

FILE NO. P-3227



CENTERDALE MANOR
NORTH PROVIDENCE, R.I.

EXPLORATION LOCATION
PLAN

FEB. 1982

FIGURE No. 1

Appendix A
Test Boring Logs

GOLDBERG · ZOINO & ASSOC., INC. GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS	PROJECT	REPORT OF BORING NO. <u>E-2</u>
	CENTERDALE MANOR	SHEET <u>1</u> OF <u>1</u>
	CENTERDALE, RHODE ISLAND	DATE <u>2/2/82</u> FILE <u>P-3227</u>

BORING CO. <u>Guild Drilling Company</u>	BORING LOCATION <u>See Location Plan</u>
FOREMAN <u>D. Serowik</u>	GROUND ELEV. _____
G-Z-A ENGINEER <u>S. Hanna</u>	DATE START <u>2/2/82</u> DATE END <u>2/2/82</u>

CASING		SAMPLER		GROUNDWATER READINGS			
SIZE: <u>none (auger)</u>	TYPE: <u>Split Spoon</u>	OTHER: _____		DATE	DEPTH	CASING AT	STABILIZATION TIME
HAMMER: _____ lb.	HAMMER: <u>140</u> lb.			2/2	4.8'	out	completion
FALL: _____	FALL: <u>30"</u>						

DEPTH	CAS. BL /FT.	SAMPLE				START CHG. and GEN. DESC.	SAMPLE DESCRIPTION CLASSIFICATION	NOTE
		NO.	PEN./REC.	DEPTH	BLOWS/6"			
2.5		S-1		0-2	auger sample	FILL	Dark brown-black, fine to medium SAND, little+ Silt, trace Organics, grading to red-brown, fine to medium SAND, little- Silt, trace+ Wood at ~1.5'	
5		S-2	24/6	2-4	13-3-4-2	4.0'	Dark brown, fine to coarse GRAVEL and SAND, trace+ Silt, trace Organics (Wood)	
							Bottom of Boring at 4.0' (required depth)	

REMARKS:

NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
 2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GOLDBERG · ZOINO & ASSOC., INC. GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS		PROJECT CENTERDALE MANOR CENTERDALE, RHODE ISLAND		REPORT OF BORING No. E-3 SHEET 1 OF 1 DATE 2/2/82 FILE P-5227	
BORING CO. <u>Guild Drilling Company</u>		BORING LOCATION <u>See Location Plan</u>			
FOREMAN <u>S. Serowik</u>		GROUND ELEV. _____			
G-Z-A ENGINEER <u>S. Hanna</u>		DATE START <u>2/2/82</u>		DATE END <u>2/2/82</u>	

CASING		SAMPLER		GROUNDWATER READINGS			
SIZE: <u>none (auger)</u>	TYPE: <u>Split Spoon</u>	OTHER: _____		DATE	DEPTH	CASING AT	STABILIZATION TIME
HAMMER: _____ lb.	HAMMER: <u>140</u> lb.			2/2	4.3'	out	completion
FALL: _____	FALL: <u>30"</u>						

DEPTH	CAS. BL /FT.	SAMPLE				STRATA CHG. and GEN. DESC.	SAMPLE DESCRIPTION CLASSIFICATION	NOTE
		NO.	PEN./REC.	DEPTH	BLOWS/6"			
2.5		S-1		0-2	auger sample	FILL	Brown, fine to medium SAND, some Silt, trace Organics, Wood, coarse Sand	
5		S-2	24/6	2-4	7-4-6-3	4.0'	Brown, fine to medium SAND, trace Silt, ~1" layer PEAT	
						Bottom of Boring at 4.0' (required depth)		

REMARKS:

NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
 2) WATER LEVEL READINGS HAVE BEEN MADE IN THE BELL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

[illegible]

REMARKS:

NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GOLDBERG · ZOINO & ASSOC., INC.
GEOTECHNICAL/GEOHYDROLOGICAL
CONSULTANTS

PROJECT
CENTERDALE MANOR
CENTERDALE, RHODE ISLAND

REPORT OF BORING NO. B-7
SHEET 1 OF 1
DATE 2/2/82 FILE P-3227

BORING CO. Guild Drilling Company
FOREMAN D. Serowik
G-Z-A ENGINEER S. Hanna

BORING LOCATION See Location Plan
GROUND ELEV. _____
DATE START 2/2/82 DATE END 2/2/82

CASING

SAMPLER

SIZE: none (auger) T.P.E. Split Spoon OTHER: _____
HAMMER: _____ lb. HAMMER 140 lb.
FALL: _____ FALL: 30"

GROUNDWATER READINGS

DATE	DEPTH	CASING AT	STABILIZATION T
2/2	4.2'	out	completion

DEPTH	CAS. BL /FT.	SAMPLE				STRTA CHG. and GEN. DESC.	SAMPLE DESCRIPTION CLASSIFICATION
		NO.	PEN./REC.	DEPTH	BLOWS/6"		
2.5		S-1		0-2	auger sample	FILL	Dark brown-black, fine to medium SAND, little Silt, trace Organics, trace Wood, Brick, etc.
2.5		S-2	24/15	2-4	6-3-3-2	4.0'	Dark brown, fine SAND, trace Silt, trace Organics with layers brown, fine to medium SAND, trace Silt
5							Bottom of Boring at 4.0' (required depth)

REMARKS: 1. Obstruction at ~.75'. Moved hole 2' towards E-3. Obstruction again at ~.75'. Moved 2' towards E-3. Hit obstruction at ~1'. Moved to 2' back from original location.

NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL.
2) WATER LEVEL READINGS HAVE BEEN MADE IN THE BELL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.

GOLDBERG · ZOINO & ASSOC., INC. GEOTECHNICAL/GEOHYDROLOGICAL CONSULTANTS		PROJECT CENTERDALE MANOR CENTERDALE, RHODE ISLAND		REPORT OF BORING NO. E-9 SHEET <u>1</u> OF <u>1</u> DATE <u>2/2/82</u> FILE <u>P-3227</u>																					
BORING CO. <u>Guild Drilling Company</u> FOREMAN <u>D. Serowik</u> G-Z-A ENGINEER <u>S. Hanna</u>		BORING LOCATION <u>See Location Plan</u> GROUND ELEV. _____ DATE START <u>2/2/82</u> DATE END <u>2/2/82</u>																							
CASING SIZE: <u>none (auger)</u> HAMMER: _____ lb. FALL: _____		SAMPLER TYPE: <u>Split Spoon</u> OTHER: _____ HAMMER <u>140</u> lb. FALL: <u>30"</u>		GROUNDWATER READINGS <table border="1" style="width:100%; border-collapse: collapse;"> <tr> <th>DATE</th> <th>DEPTH</th> <th>CASING AT</th> <th>STABILIZATION TIME</th> </tr> <tr> <td>2/2</td> <td>31"</td> <td>out</td> <td>completion</td> </tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td></tr> </table>		DATE	DEPTH	CASING AT	STABILIZATION TIME	2/2	31"	out	completion												
DATE	DEPTH	CASING AT	STABILIZATION TIME																						
2/2	31"	out	completion																						
DEPTH	CAS. BL /FT.	SAMPLE				STRATA CHG. and GEN. DESC.	SAMPLE DESCRIPTION CLASSIFICATION	NOTE																	
2.5		S-1		0-2	auger sample	FILL	Green-gray, fine to coarse SAND, some- Silt, trace coarse Gravel																		
		S-2	24/15	2-4	3-3-2-2																				
5						4.0'	Brown, fine to medium SAND, trace Silt, changing to black Silty PEAT at ~3'. Oily odor																		
Bottom of Boring at 4.0' (required depth)																									
REMARKS:																									
NOTES: 1) THE STRATIFICATION LINES REPRESENT THE APPROXIMATE BOUNDARY BETWEEN SOIL TYPES AND THE TRANSITION MAY BE GRADUAL. 2) WATER LEVEL READINGS HAVE BEEN MADE IN THE DRILL HOLES AT TIMES AND UNDER CONDITIONS STATED ON THE BORING LOGS. FLUCTUATIONS IN THE LEVEL OF THE GROUNDWATER MAY OCCUR DUE TO OTHER FACTORS THAN THOSE PRESENT AT THE TIME MEASUREMENTS WERE MADE.																									

Appendix B
Compounds Analyzed

Metals

Arsenic
Barium
Cadmium
Total Chromium
Lead
Mercury
Silver
Selenium

VOLATILE ORGANIC PRIORITY POLLUTANTSCOMPOUND

chloromethane
dichlorodifluoromethane
bromomethane
vinyl chloride
methylene chloride
trichlorofluoromethane
1,1-dichloroethylene
bromochloromethane
1,1-dichloroethane
trans-1,2-dichloroethylene
chloroform
1,2-dichloroethane
1,1,1-trichloroethane
carbon tetra chloride
bromodichloromethane
1,2-dichloropropane
trans-1,3-dichloropropene
trichloroethylene
dibromochloromethane
cis-1,3 dichloropropene
1,1,2-trichloroethane
benzene
bromoform
tetrachloroethylene
1,1,2,2-tetrachloroethane
1,4-dichlorobutane
toluene
chlorobenzene
ethylbenzene

Detection limit: <1 ppb

Semivolatile OrganicsCOMPOUND - Acids

* 2,4,6-trichlorophenol
* p-chloro-m-cresol
* 2-chlorophenol
* 2,4-dichlorophenol
* 2,4-dimethylphenol
* 2-nitrophenol
* 4-nitrophenol
** 2,4-dinitrophenol
** 4,6-dinitrophenol
* pentachlorophenol
* phenol

COMPOUND - Base/Neutrals

acenaphthene
benzidine
1,2,4-trichlorobenzene
hexachlorobenzene
hexachloroethane
bis(chloromethyl)ether
bix(2-chloroethyl)ether
2-chloronaphthalene
1,2-dichlorobenzene
1,3-dichlorobenzene
1,4-dichlorobenzene
3,3'-dichlorobenzidine
2,4-dinitrotoluene
2,6-dinitrotoluene
1,2-diphenylhydrazine
fluoranthene
4-chlorophenyl phenyl ether
4-bromophenyl phenyl ether
bis(2-chloroisopropyl)ether
bis(2-chloroethoxy)methane
hexachlorobutadiene
hexachlorocyclopentadiene
isophorone
naphthalene
nitrobenzene
N-nitrosodimethylamine
N-nitrosodiphenylamine
N-nitrosodi-n-propylamine
bis(2-ethylhexyl)phthalate
butyl benzyl phthalate
di-n-butyl phthalate

COMPOUND - Base/Neutrals (cont'd)

di-n-octyl phthalate
diethyl phthalate
dimethyl phthalate
benzo(a)anthracene
benzo(a)pyrene
3,4benzofluoranthene
benzo(k)fluoranthene
chryzene
acenaphthylene
anthracene
benzo(g,h,i)perylene
fluorene
phenanthrene
dibenzo(a,h)anthracene
indeno(1,2,3-cd)pyrene
pyrene

Detection limit: 10 ppb
* detection limit: 25 ppb
** detection limits: 250 ppb

Appendix C
Chemical Test Results



R.I. Analytical Laboratories, Inc.

SPECIALIZING IN ENVIRONMENTAL ANALYSIS

231 ELM STREET
WARWICK, R. I. 02888

PHONE: (401) 467-2452

CERTIFICATE OF ANALYSIS

REPORT TO: Goldberg Zoiano & AssociatesDATE RECEIVED 2/2/82293 South Main StreetDATE REPORTED 2/10/82Providence, RI 02903PURCHASE ORDER NO. P-3227Attn: Mr. Michael PowersR.I.A.L. INV. NO. 6015SAMPLE DESCRIPTION Fill material from proposed Centerdale Manor

Per your request, subject sample has been analyzed by our laboratory with the following results:

PARAMETERRESULTS

Volatile Organics:*

Chloroform	3.4 ppb
Trichloroethylene	5.1 ppb
Toluene	2.6 ppb

Semivolatile Organics:*

Acid Compounds	N.D.
----------------	------

Base/Neutral Compounds:

Bis(2-ethylhexyl)phthalate	1.3 ppb
----------------------------	---------

Arsenic	<0.01 mg/l
Barium	0.5 mg/l
Cadmium	<0.005 mg/l
Total Chromium	<0.05 mg/l
Lead	<0.1 mg/l
Mercury	<0.0005 mg/l
Silver	<0.01 mg/l
Selenium	<0.01 mg/l

Continued to Page -2-

APPROVED BY

Anthony F. Bonnett

Goldberg Zoiano & Associates
Certificate of Analysis
February 10, 1982
Page -2-

- * A list of volatile organic and semivolatile organic compounds and their detection limits is enclosed.

Note: As you requested, all above parameters were performed on an extract from the EP Toxicity Procedure, in accordance with Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, U. S. EPA, SW-846, 1980.

If you have any questions regarding this work or if we may be of further assistance, please contact us.



R.I. Analytical Laboratories, Inc.

SPECIALIZING IN ENVIRONMENTAL ANALYSIS

231 ELM STREET
WARWICK, R. I. 02888

PHONE: (401) 467-2452

CERTIFICATE OF ANALYSIS

REPORT TO: Goldberg Zoino & ASSOCS.
293 South Main Street
Providence, RI 02903
Attn: Mr. Mike Sherrill

DATE RECEIVED 3/4/82
DATE REPORTED 3/22/82
PURCHASE ORDER NO. _____
R.I.A.L. INV. NO. 6140

SAMPLE DESCRIPTION Samples from Centerdale Manor, N. Prov., RI

Per your request, subject samples have been analyzed by our laboratory with the following results:

<u>SAMPLE</u>	<u>PARAMETER</u>	<u>RESULTS</u>
#12	pH	1.1
	Sulfate (as SO ₄)	<50 mg/l
	EP Toxicity; (no extraction)	
	Arsenic	<0.5 mg/l
	Barium	<0.5 "
	Cadmium	0.23 "
	T. Chromium	0.39 "
	Lead	0.3 "
	Mercury	<0.001 "
	Silver	0.21 "
	Selenium	<0.5 "
#65	pH	9.9
	T. Cyanide	<1 mg/l
	EP Toxicity; (no extraction)	
	Arsenic	<0.5 mg/l
	Barium	<0.5 "
	Cadmium	<0.01 "
	T. Chromium	<0.1 "
	Lead	1.2 "
	Mercury	<0.001 "
	Silver	<0.05 "
	*Selenium	0.7 "

*possible analytical interference

APPROVED BY

Anthony E. Perrotti
Anthony E. Perrotti

Certificate of Analysis
Goldberg Zoino & Assocs.
March 22, 1982
Page -2-

<u>SAMPLE</u>	<u>PARAMETER</u>	<u>RESULTS</u>
Composite 61,71,72 & 57	Flash Point	>140°F
	EP Toxicity;	
	Arsenic	<0.5 mg/l
	Barium	<0.5 "
	Cadmium	<0.01 "
	T. Chromium	<0.1 "
	Lead	<0.1 "
	Mercury	<0.001 "
	Silver	<0.05 "
	Selenium	<0.5 "
	Volatile Organics;	
	All compounds	N.D.
	Composite 62A & 62B	Flash Point
Volatile Organics;		
toluene		196 ppm
	all other compounds	N.D.
Composite 64,74,59 & 73	Flash Point (sam.#64)	106°F
	Flash Point (sam.#59)	128°F
	Flash Point (sam.#73 &74)	>140°F
	EP Toxicity;	
	Arsenic	<0.5 mg/l
	Barium	<0.5 "
	Cadmium	<0.01 "
	T. Chromium	<0.1 "
	Lead	0.1 "
	Mercury	<0.001 "
	Silver	<0.05 "
	Selenium	<0.5 "
	Volatile Organics	
	xylene	13,600 ppm
	ethyl benzene	180 ppm
	all other compounds	N.D.

continue to Page -3-

Certificate of Analysis
Goldberg Zoino & Assocs.
March 22, 1982
Page -3-

<u>SAMPLE</u>	<u>PARAMETER</u>	<u>RESULTS</u>
Composite 55 & 56	Flash Point (sam. #55)	72°F
	Flash Point (sam. #56)	82°F
	EP Toxicity;	
	Arsenic	<0.5 mg/l
	Barium	<0.5 "
	Cadmium	<0.01 "
	T. Chromium	<0.1 "
	Lead	2.0 "
	Mercury	<0.001 "
	Silver	<0.05 "
	Selenium	<0.5 "
	Volatile Organics;	
	toluene	5,500 ppm
	xylene	47,000 ppm
	ethyl benzene	7,100 ppm
	all other compounds	N.D.
Composite 63,66,67,68	Flash Point	>140°F
	EP Toxicity;	
	Arsenic	<0.5 mg/l
	Barium	<0.5 "
	Cadmium	0.23 "
	T. Chromium	<0.1 "
	Lead	<0.1 "
	Mercury	<0.001 "
	Silver	<0.05 "
	Selenium	<0.5 "
	Volatile Organics;	
	xylene	690 ppm
	ethyl benzene	1,100 ppm
	all other compounds	N.D.
Composite 25,31,36,50 53,58 & 60	Flash Point	>140°F
	EP Toxicity;	
	Arsenic	<0.5 mg/l
	Barium	<0.5 "
	Cadmium	0.13 "
	T. Chromium	<0.1 "
	Lead	2.1 "
	Mercury	<0.001 "
	Silver	<0.05 "
	Selenium	<0.5 "

Certificate of Analysis
Goldberg Zoino & Assocs.
March 22, 1982
Page -4-

Note: A list of volatile organic compounds tested for and their detection limits is attached.

Metal analyses performed in accordance with "Characteristic of EP Toxicity", Federal Register, Vol. 45, No. 98, Monday, May 19, 1980, Rules and Regulations.

If you have any question regarding this work or if we may be of further assistance, please contact us.

FIELD SUMMARY

FILE No. P-3227

DATE 2/22/82 REPORT No. One SHEET 1 OF 1
PROJECT Centerdale Manor-Site Clearance LOCATION North Providence, R.I.
CLIENT Marshall Engineering CONTRACTOR Pezza
WEATHER CONDITIONS Clear REMARKS Below, D.

A. Arrived on site 0700 hours.

B. Equipment working:

- 1) 1 JD510 backhoe with front loading bucket.
- 2) 1 6-wheel dump truck.
(both vehicles supplied by Pezza)
- 3) 1 operator, 1 foreman and 2 laborers.

C. Work accomplished:

One large concentration of disposed drums was removed from an area along the banks of the Woonasquatucket River and scattered drums were removed from the south end and east portions of the site. This observer selected drums to be saved for later sampling and analysis of contents for subsequent determination by DEM of appropriate disposal techniques.

D. Remarks:

- 1) Pezza employees were informed of the need for individual protective gear and cautioned to remove said equipment before leaving the site for lunch or the end of the day's work. A first aid station was maintained on site.
- 2) Drum excavation and removal techniques were modified slightly from those established by DEM. Drums selected for sampling were moved by sling onto the dump truck and subsequently transported to the concrete containment area. Approximately twenty (20) drums were segregated as to probable liquid, solid, or questionable contents.

E. Visitors:

Undersigned met Bill Lund and site supervisor for Marshall Engineering at 0800 hours. John Leo, a DEM engineer from Air and Hazardous Waste, visited the site and expressed approval of protective gear and drum removal techniques.

F. Left site 1600 hours.

Distribution:

William Lund, Marshall Engineering
John Leo, RIDEM
Gerard Graf, Robinson, Green, Beretta Corp.

ON-JOB TIME 8.5
TRAVEL TIME .5
OFFICE TIME --
TOTAL TIME 9.0



Michael Sherrill

PREPARED BY

FIELD SUMMARY

FILE No. P-3227

DATE 2/23/82 REPORT No. Two SHEET 1 OF 1
PROJECT Centerdale Manor LOCATION North Providence, R.I.
CLIENT Marshall Engineering CONTRACTOR Pezza
WEATHER CONDITIONS Clear REMARKS Below, D.

A. Arrived on site 0730 hours.

B. Equipment working:

- 1) 1 JD510 backhoe with front loading bucket.
- 2) 1 6-wheel dump truck.
- 3) 1 operator, 1 foreman and 1 laborer.

C. Work accomplished:

- 1) Clearing of the southeast corner of the site continued. Drums were culled from trash piles and removed by hand or with the backhoe from the marsh areas. Drums adjudged to contain no chemical wastes materials were crushed and stockpiled on site for later disposal.
- 2) Approximately fifteen (15) drums were placed in the containment area for subsequent sampling. Three (3) 1-pint jars, one 1-gallon plastic jug, and one 1.5 liter bottle of unidentified liquid contents were unearthed and hand carried to the containment area.

D. Remarks:

- 1) Site was inspected by John Leo of R.I.D.E.M. He expressed satisfaction and approval of clearing operations.
- 2) Removal of drums from wet marsh area disturbed bottom materials and released unpleasant odors; when disturbance of this area ceased, odors dissipated. It is believed that the gases responsible are due to natural decay of vegetation rather than the release of disposed drum contents.
- 3) An insurance agent representing Pezza employees briefly observed removal operations. The individual commented that unprotected persons should be waved off from approaching the area.

E. Left site 1600 hours.

Distribution:

William Lund, Marshall Engineering
John Leo, RIDEM
Gerard Graf, Robinson, Green, Beretta Corp.



ON-JOB TIME 8.0
TRAVEL TIME .5
OFFICE TIME --
TOTAL TIME 8.5

Michael Sherrill

PREPARED BY

FIELD

SUMMARY

FILE No. P-3227

DATE 2/24/82 REPORT No. Three SHEET 1 OF 1
PROJECT Centerdale Manor LOCATION North Providence, R.I.
CLIENT Marshall Engineering CONTRACTOR Pezza
WEATHER CONDITIONS Clear/Windy REMARKS Below, D.

A. Arrived on site 0730 hours.

B. Equipment working:

- 1) 1 backhoe with front bucket.
- 2) 1 dump truck.
- 3) 1 operator, 1 foreman and 1 laborer.

C. Work accomplished:

- 1) The marsh at the south end of the site was cleared of visible drums and three (3) large trash heaps were culled for hidden drums. This observer selected approximately ten (10) drums for containment and subsequent sampling.
- 2) One trash heap at the southwest end of the site was colored with fluorescent powder. Drums were culled from this pile for disposal and the remaining material was segregated for subsequent inspection by John Leo of RI DEM.

D. Remarks:

- 1) Representatives of the town visited the containment area and construction trailer.
- 2) Gusting winds produced some hazard of airborne particles; however, no problem developed.

E. Left site 1600 hours.

Distribution:

William Lund, Marshall Engineering
John Leo, RIDEM
Gerard Graf, Robinson, Green, Beretta Corp.

ON-JOB TIME 8.0
TRAVEL TIME .5
OFFICE TIME --
TOTAL TIME 8.5



Michael Sherrill

PREPARED BY

FIELD SUMMARY

FILE No. P-3

DATE 2/25/82 REPORT No. Four SHEET 1 OF 1
PROJECT Centerdale Manor LOCATION North Providence, R.I.
CLIENT Marshall Engineering CONTRACTOR Pezza
WEATHER CONDITIONS Clear/Windy REMARKS Below, D.

A. Arrived on site 0730 hours.

B. Equipment working:

- 1) 1 JD 510 backhoe with front bucket.
- 2) 1 dump truck.
- 3) 1 operator, 1 foreman and 1 laborer.

C. Work accomplished:

- 1) Visible drums were removed from banks of the river and along the northeast bank of the swale. Approximately seven (7) drums were removed to the containment area for subsequent sampling.
- 2) Piles of crushed drums were collected and moved to the crushed drum staging area for subsequent removal and disposal off site.
- 3) At approximately 1330 hours, excavation of one (1) partially buried drum along the east section also unearthed a second drum which immediately emitted heavy gray smoke upon exposure to the air. Workers were waved off and Marshall survey crew was advised to avoid the area.

This observed notified John Leo of R.I.DEM, who arrived on site and directed the removal, sealing and handling of this drum. Pezza personnel were instructed as to proper procedure in the event of similar occurrences during future excavations in the area. No injuries were sustained.

This drum continued smoking slightly when in containment area, was resealed and removed from other drums.

D. Left site 1600 hours.

Distribution:

William Lund, Marshall Engineering
John Leo, RIDEM
Gerard Graf, Robinson, Green, Beretta Corp.



ON-JOB TIME	<u>8.0</u>
TRAVEL TIME	<u>.5</u>
OFFICE TIME	<u>--</u>
TOTAL TIME	<u>8.5</u>

Michael Sherrill

PREPARED BY

FIELD SUMMARY

FILE No. P-3227

DATE 2/26/82 REPORT No. Five SHEET 1 OF 1
PROJECT Centerdale Manor LOCATION North Providence, R.I.
CLIENT Marshall Engineering CONTRACTOR Pezza
WEATHER CONDITIONS Clear/Windy REMARKS _____

A. Arrived on site 0830 hours.

B. Equipment working:

- 1) 1 Fiat-Allis front-end loader with operator.
- 2) 1 foreman.
- 3) Dump trucks with drivers.

C. Work accomplished:

- 1) Pezza crew initiated removal of crushed drums from site.
- 2) John Leo of RIDEM and the undersigned opened and sampled the barrels held at the containment area. Approximately twenty (20) barrels were adjudged to contain no hazardous materials and were marked for crushing and removal.

The remainder were segregated as to liquid, solid, or corrosive contents. These were sampled. Based upon subsequent testing, the final disposition of these drums shall be determined by the DEM.

D. Remarks:

- 1) A representative of Marshall was notified that disposition of the remaining drums was contingent upon analysis of samples.
- 2) Pezza foreman was notified to remove additional drums from containment area marked for crushing and non-hazardous solid waste disposal. He was advised to continue handling of any drums encountered in subsequent excavations in the manner established during the past week. Any suspicious drums are to be handled with protective covering. The foreman has phone numbers for RIDEM and Goldberg-Zoino offices in the event additional smoking or drums of questionable contents are uncovered.

E. Left site at 1330 hours.

Distribution:

William Lund, Marshall Engineering
John Leo, RIDEM
Gerard Graf, Robinson, Green, Beretta Corp.

ON-JOB TIME 5.0
TRAVEL TIME .5
OFFICE TIME 2.0
TOTAL TIME 7.5



Michael Sherrill

PREPARED BY

- ① Face mask
- ② Tyvek -
- ③ disposal boots
- ④ work over boot
- ⑤ surgical glove
- ⑥ work gloves
- ⑦ goggles
- ⑧ hard hat

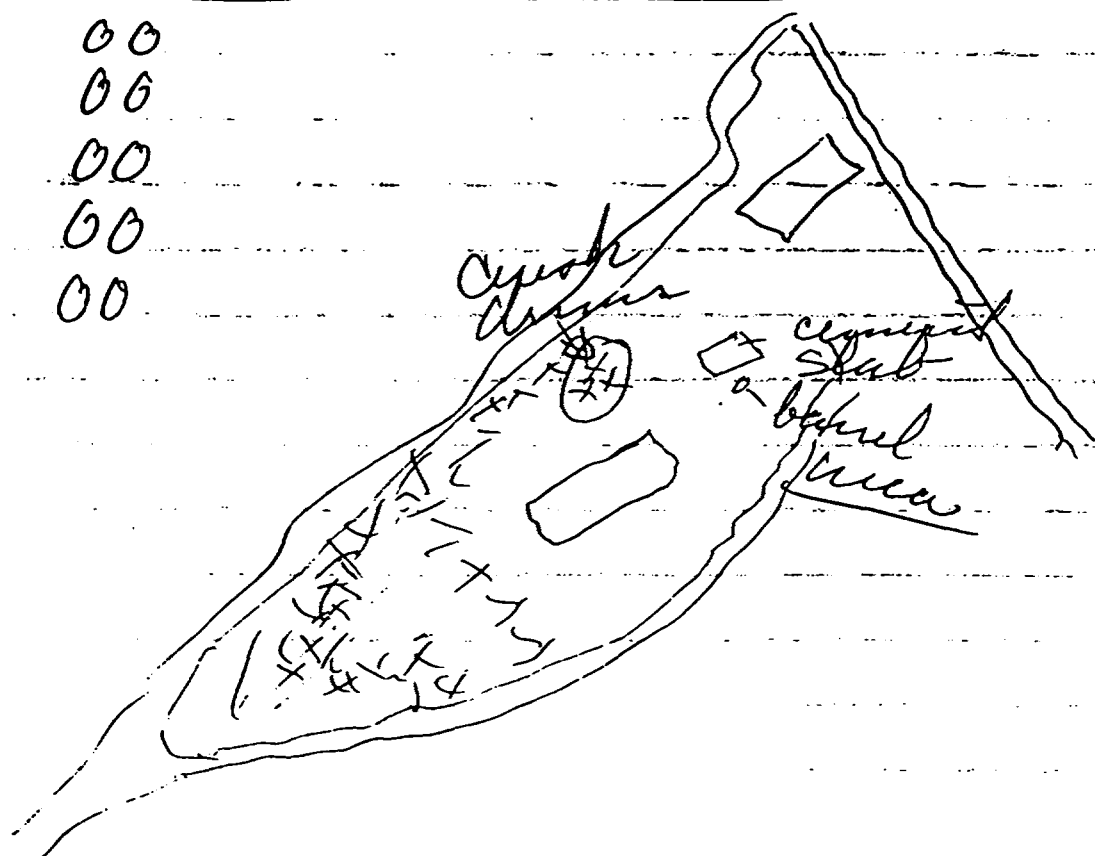
○ - empty
crush
drum

○ ?
drum

○ - solid
drums

○ - large
drum

OO
OO
OO
OO
OO



ALSO: CONTR - if someone is uncertain
about working is stuff,
replace -

1) PROTECTIVE EQUIP:

NOTE: HANDLERS AND OPERATOR

TYVEK SUIT
SURG. GLOVES
RUBBER GLOVES
BOOTS → DISP. BOOT → RUBBER BOOT
* RESPIRATORS
HARD HAT

① Procedure for taking off & putting on.

② Coffee break - remove suit, gloves, etc.

③ Don't leave site wearing suits.

1) ACCIDENT

1) Materials:

① Empty drums → pull out, crush, load, & remove to stockpile.

② Full drums → if open - place on end in bucket, bring up, & move to concrete pad - place in rows of 2 abreast.

③ Push - if clothes, or if rocks back → LIQUID

④ If very heavy, & no rock back, → SOLIDS

* ⑤ Questionable drums - segregate

* Drums with plastic liners → ACIDS, possibly. TAKE CARE

* Drums with steel reinforcing → " TAKE CARE

⑥ Drums buried → DIG AROUND & then use SLING TO PICK-UP. DO NOT USE TEETH OF BUCKET TO GRASP OR PICK-UP FROM BENEATH.

⑦ ANY QUEST. DRUM → FUMES, HISSING, LEAVE IT. WILL MARK THE AREA.

Field

Sampling → ① Flash pt - open cup flame test

② Corrosivity test - PH paper

PH - 1-12

water & ③ glass beaker - 500 mL
reacted ④ disposable pasture pipet
+ with bulb
specific gravity.

⑤ Cyanide test - for solution
PH 8-14 with cyanide paper

Sampling tools

- ① Planting trowel
- ② Copper tube - several 3/8" solid
- ③ glass tubing
- ④ malleable pint jar
- ⑤ PH Paper - 1-12 - reaching eastern scientific
- ⑥ indelible marker
- ⑦ rags
- ⑧ plastic sheeting

Safety - FIRST aid kit
eye wash - plastic
fire extinguisher

RI ANALYT ~~TOX METALS?~~



TIME

HEAVY METALS

How?

EXTRACT

TESTS → 6 BATCH
→ 1 SEP.

#2138.00 Char. 1 wk +
Price + V.O.'s - 1-2

FLASH POINT 6 TESTS on Batched Samples

1 wk

VOLATILE ORGANICS 5 TESTS on Batched Samples

pH - 2 TESTS

Sulfates 1 TEST

CN⁻ Cyanide 1 TEST

1 Sample pH Sulfates H M — 3 TESTS

1 Sample pH CN⁻ H M — 3 TESTS

4 Batch S F.P. V.O. H M — 12 TESTS

1 "Lab pack" Batch F.P. V.O. — 2 TESTS.

~~Copper & Nickel #48.~~

EP TOXICITY? ~ 50/SAMPLE up Solids —

Tot. Metals
LEACHATE?

EXTRACTABLE METALS

TOXICANT STEP FOR

Non-LEACHABLE

After Non-Haz

As
Bar
Cadm
Chrom
Lead
Mer
Selenium
Silver

Tony (467-2452)

Centradal analysis

Get \$, price
by test -
time

lab analysis

sample #

Moxa Lin
Coca-Cola
Water Co

4 CORN - PETRA

12 L - PH - Sulfate Heavy metals
BASE 65 L - CK -

Loss
of T9
100
Site

61 } Raspberry FL pt volatils organics Henrys
71 } colored
72 }
57 } Sol's - gran/
powders

62A } Lab pack FL pt 11 11 has formaldehyde
62B } LIQ

64 } Plum
74 } Solid
59 } Green
73 }

55 } Salas 11 11 11
56 }

63 } Painty
66 } Solids
67 }
68 }

Solids → Sec. L.F.
NINGREA

25
31
36
50
53
58

} white
flaky
solids

heavy metals Flash point

12/60:
FUMES: Sulfur Trioxide

FIELD

SUMMARY

FILE No. P-3227.2

DATE March 18, 1982 REPORT No. 4 SHEET 1 OF 2
 PROJECT Centerdale Manor LOCATION North Providence, R. I.
 CLIENT Marshall Contractors CONTRACTOR American Pile Driving/Pezza
 WEATHER CONDITIONS Clear 40's-50's REMARKS Pile Driving Logs Attached
Site Sketch Attached

1) Arrived on site at 0815 hours.

2) Equipment working:

- a) 1 John Deere JD510 Backhoe
- b) 1 Fiat Allis 21B Dozer
- c) 1 Buffalo Bomag BW210 Vibratory Compactor
- d) 4-5 Ten-Wheel Dump Trucks
- e) 1 Crane w/Vulcan 06 Pile Driving Hammer and Ingersoll Compressor (AIR 008)

3) Work being accomplished:

- a) Siltation Fence: The JD510 Backhoe and laborers excavated a ditch line, along the eastern side of the site. The ditch was approximately 5'W. x 2'D. and continued for the entire length of the site. Hay bales were positioned and staked within the ditch line by laborers. The hay bale "fence" line will act as a siltation barrier between the site and the adjacent lowland. (The siltation fence will be constructed around the entire site). Work was not complete by the end of the day.

It was reported by Marshall site personnel that several barrels were uncovered during excavation of the ditch. The barrels were transported to the previously established containment area for subsequent analyses and disposal.

- b) Fill Placement: Granular fill placement continued in the northern half of the site. The granular fill was obtained from an off-site source by Pezza and hauled on site. The Fiat Allis 21B Dozer was used to spread fill in approximately 12 inch(±) thick lifts. Cobbles/boulder-size material was picked from the fill and stockpiled along the outside boundaries of the site. Compaction of the fill was performed by the Vibratory Compactor. A minimum of four to six passes by the compactor over several portions of the fill area was observed by the undersigned during several periods throughout the day. No field density tests were performed this date.
- c) Pile Installation: Six production and one test pile were installed this date. Messrs. Charles Guild (American Pile Driving) and Richard Moulton (Interpile USA) were on site to direct pile driving operations. Mr. Michael Powers, GZA, was on site to discuss driving criteria with Messrs. Guild and Moulton.

Initially, four production piles (Locations 9-1, 9-2, 9-3 and 8-1) were installed. Final driving depths were determined by Messrs. Guild and Moulton following discussions with Mr. Powers. Specifications call for

ON-JOB TIME _____

TRAVEL TIME _____

OFFICE TIME _____

TOTAL TIME _____



PREPARED BY _____

FIELD SUMMARY

FILE No. P-3227.

DATE March 18, 1982 REPORT No. 4 SHEET 2 OF 2
PROJECT Centerdale Manor LOCATION No. Providence, R.I.
CLIENT Marshall Contractors CONTRACTOR American Pile Driving/Pezza
WEATHER CONDITIONS Clear 40's-50's REMARKS Pile Driving Logs Attached

the final driving criteria to be not less than six (6) blows per inch of penetration, or to a total depth of forty (40) feet, whichever occurs at a higher elevation. Mr. Moulton noted that this criteria was somewhat stringent for the "Interpile" system being used due to the absence of side friction during driving. Mr. Moulton demonstrated the use of a total blow count value as a better indicator of the bearing ability of the Interpile. He noted that this method had been evaluated through many Interpile installation projects. Mr. Powers agreed to Mr. Moulton's recommendations; however, noted that a re-evaluation of the driving criteria would be based on the performance of the pile load test. Mr. Powers also noted that the test pile should be driven to the least criteria set by the six production piles driven this date, so that a representative test of the piles driven could be performed. Messrs. Guild and Moulton agreed to Mr. Powers recommendation.

Subsequently, the test pile and two additional production piles (Locations 8.5-1, 8-2, and 8-3, respectively) were installed. Pile driving logs recorded by the undersigned are attached with this report.

Cement grout used for all piles installed this date was obtained from Pawtucket Concrete. Flow cone measurements were made at the start of installation of each pile by a Guild representative, under the direction of Mr. Moulton. Three standard concrete cylinders and six cubes of the cement grout were prepared from the grout mix used in the test pile by a representative of the Thompson & Lichtener Testing Laboratory.

4) Visitors on site:

- a) Gerhard Graf (Robinson Green Beretta Corp.)
- b) Bill Lund (Marshall Contractors)
- c) Vito A. Nacci (Prof. of Soils & Foundation Egr., URI)

5) Left the site @ 1545 hours.

DISTRIBUTION:

Bill Lund (Marshall Contractors)
Gerhard Graf (Robinson Green Beretta Corp.)
Charles Guild (American Pile Driving) - Pile Driving Logs Only
Michael Puddicombe (Marshall Contractors)

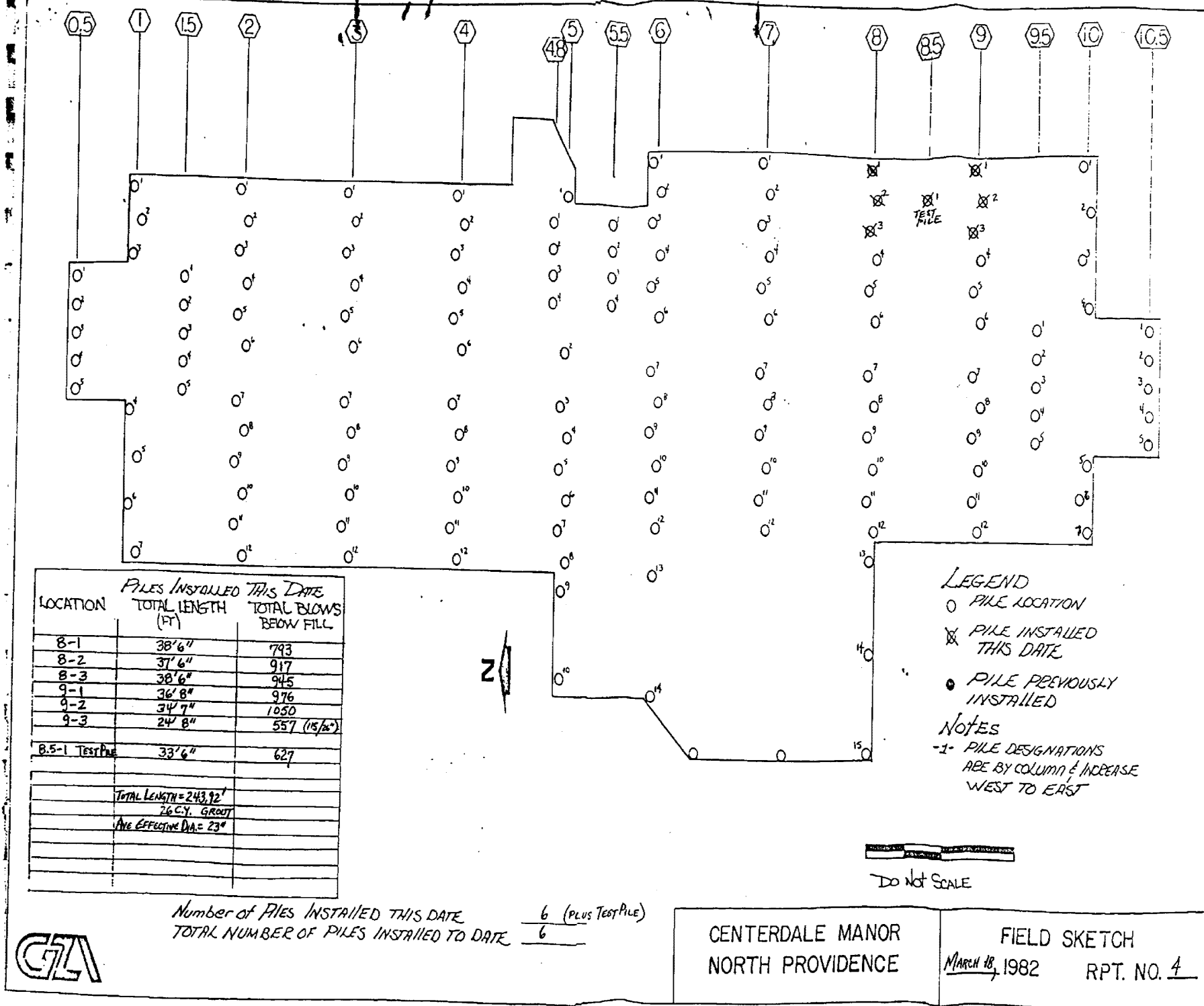


ON-JOB TIME 7½
TRAVEL TIME ½
OFFICE TIME _____
TOTAL TIME 8 hours

Walter Kosinski

Walter Kosinski

PREPARED BY





R.I. Analytical Laboratories, Inc.

SPECIALIZING IN ENVIRONMENTAL ANALYSIS

231 ELM STREET
WARWICK, R. I. 02888

PHONE: (401) 467-2452

CERTIFICATE OF ANALYSIS

REPORT TO: Goldberg Zoiano & Associates
293 South Main Street
Providence, RI 02903
Attn: Mr. Michael Powers

DATE RECEIVED 2/2/82
DATE REPORTED 2/10/82
PURCHASE ORDER NO. P-3227
R.I.A.L. INV. NO. 6015

SAMPLE DESCRIPTION Fill material from proposed Centerdale Manor

Per your request, subject sample has been analyzed by our laboratory with the following results:

<u>PARAMETER</u>	<u>RESULTS</u>
Volatile Organics:*	
Chloroform	3.4 ppb
Trichloroethylene	5.1 ppb
Toluene	2.6 ppb
Semivolatile Organics:*	
Acid Compounds	N.D.
Base/Neutral Compounds:	
Bis(2-ethylhexyl)phthalate	1.3 ppb
Arsenic	<0.01 mg/l
Barium	0.5 mg/l
Cadmium	<0.005 mg/l
Total Chromium	<0.05 mg/l
Lead	<0.1 mg/l
Mercury	<0.0005 mg/l
Silver	<0.01 mg/l
Selenium	<0.01 mg/l

Continued to Page -2-

APPROVED BY

Anthony E. Perrotti

Goldberg Zoiano & Associates
Certificate of Analysis
February 10, 1982
Page -2-

- * A list of volatile organic and semivolatile organic compounds and their detection limits is enclosed.

Note: As you requested, all above parameters were performed on an extract from the EP Toxicity Procedure, in accordance with Test Methods for Evaluating Solid Waste, Physical/Chemical Methods, U. S. EPA, SW-846, 1980.

If you have any questions regarding this work or if we may be of further assistance, please contact us.